ITEM 604.04M MANHOLES AND JUNCTION CHAMBERS

DESCRIPTION

This work shall consist of the construction of manholes and junction chambers as shown on the plans and in accordance with these specifications.

MATERIALS

Brick: Brick shall be first quality, sound, hard-burned common brick, conforming to ASTM C32, manhole brick, Grade MS (for grade adjustment) and sewer brick, Grade SS (for inverts and benches). Brick shall be culled of all irregulars and unsound or damaged brick before laying.

Mortar: Portland Cement mortar conforming to ASTM C270, Type M, Mortar for Unit Masonry.

Concrete and Reinforcing Steel: Concrete and reinforcing steel shall confirm to the requirements of NYSDOT Subsection 604.2.

Castings for Frames, Grates, Covers and Shear Gates: Castings for frames, grates, covers and shear gates shall be true to pattern in form and dimensions without sharp unfilleted angles or corners; and shall be free from pouring faults, sponginess, cracks, blow holes and other defects in locations affecting their strength and value for the service intended. All old castings and steel frames and grates being replaced in this contract shall become the property of the Rochester Pure Waters District and they shall be delivered to Monroe County Facilities, 444 E. Henrietta Road, Rochester, New York, at no extra cost to the COUNTY.

Cast Iron Castings: Cast Iron castings shall conform to the requirements of ASTM A48 Class 30B. All castings shall be coated with a coal tar pitch varnish which will result in a smooth, tough coating that is not tacky or brittle.

Manufacturer: Casting shall be Syracuse Castings Sales Corporation, Number 1032, Neenah Number R-1726-A for Standard Manhole Castings; or Neenah No. R-1755-FOR or Syracuse Castings Sales Corporation Number 1539-A for water tight manhole castings. Catalog numbers indicated are given to show the required type and configuration only. Castings shall be the product of a recognized manufacturer with satisfactory experience in the production of castings of the type indicated and specified.

Frames and Covers: Frames and covers shall be accurately made and covers shall fit in any position without rocking. Horizontal and vertical fitting surfaces shall be milled to a true and even surface to insure uniform bearing. Units shall be interchangeable. Shop drawings shall be submitted for approval together with an affidavit from the manufacturer certifying compliance with the material specifications. All manhole covers shall have concealed or blind pick holes.

Manhole Cover Imprint: The word 'SANITARY' or "STORM", and "MCPW" or "MCDOT" in

letters not less than 50mm high shall be stamped or cast into all sanitary and storm manhole covers so as to be plainly visible.

Manhole Steps: Manhole steps shall be Neenah R-1981-1 or N.M. Aluminum F14-2-B or approved equal. All steps shall be cast into the walls of the manholes so as to form a continuous ladder with a distance of 300mm between steps. The embedded portion of the step shall be coated with a 0.4mm coat of coal tar coating.

CONSTRUCTION DETAILS

General: It is the intent of this specification to secure soundly constructed, watertight manholes and junction chambers constructed in accordance with the plans. Foundations shall not be placed upon frozen or muddy subgrades. Precast concrete sections shall be the product of a recognized manufacturer experienced in the production of precast manhole sections of the type indicated and specified. Complete shop drawings of manholes and junction chambers and complete data on the gaskets proposed for use at the joints between precast sections, shall be submitted for the approval of the ENGINEER as specified in the General Conditions.

The design and construction of all reinforced concrete structures shall conform with the American Concrete Institute Standard 318-77 titled "Building Code Requirements for Reinforced Concrete", unless otherwise indicated on the drawings as specified herein.

Cast-In-Place Manhole Bases and Chambers: Cast-in-place bases and chambers shall be constructed of reinforced concrete as shown on the plans. Concrete manhole foundations shall be placed over a surrounding 0.1mm polyethylene sheet.

Precast Manhole Bases and Chambers: Round precast concrete manhole bases shall conform to the requirements of ASTM C478. Other precast bases and chambers shall be constructed of reinforced concrete as shown on the plans. The bases shall have an approved positive entry seal for main sewer connections except when steel ring joint R.C.P. is used. When steel ring joint R.C.P. is used, the bases shall have steel bell wall fittings compatible with the main sewer joints cast in the side walls. Bedding for precast manhole bases shall be as shown on the plans.

Precast Manhole Riser and Top Slabs: Precast concrete, riser and transition sections, top slabs and grade rings shall conform to the requirements of ASTM C478. Joints between riser sections shall be provided with round rubber gaskets conforming to the requirements of ASTM C443. Top slabs shall be designed to support an HS 20-44 vehicular loading unless otherwise shown on the plans.

Lifting Holes: Lifting holes shall have a maximum depth of one-half of the riser wall thickness and shall be filled with Mainstay or an epoxy mortar after the manhole is set in place.

Installation: The top of the slab or walls of the cast-in-place concrete chamber or base, and precast bases shall be formed to fit the lower end of the first precast concrete riser. The shaping shall be done with an approved cast iron pallet accurately shaped to the required round rubber gasket which, when assembled, shall be self-centering and make a uniform watertight joint.

Joints between precast manhole sections shall be provided with a round rubber gasket conforming to the requirements of ASTM C443 when assembled, shall be self-centering and make a uniform watertight joint. The gasket spaces between the bell and spigot shall be so shaped as to provide either grooves or shoulders that will prevent the gasket from disengaging from its compression surfaces or being blown out by hydrostatic pressure. A casting of Pioneer 301 thermo setting joint compound manufactured by the Daubert Chemical Company, or approved equal, shall be applied to the outside of all manhole joints.

Cast-in-place bases shall be pipe stubs integrally cast into the side walls at the time the concrete is poured except when the main sewer is R.C.P. with steel ring joints. When the main sewer is R.C.P. with steel ring joints, steel bell wall fittings shall be cast in the side walls to receive the pipe ends. Bell wall fittings shall be adequately supported with timber or steel struts or by the pipe stub spigot during concrete placing to maintain them true and round. Continuous 150mm PVC waterstops shall be formed into all construction joints as indicated on the plans and/or as ordered by the ENGINEER. Waterstops shall be Greenstreak type 705 PVC or approved equal.

The bell at the upper end of the riser sections and cast-in-place concrete base shall be wiped free of all dirt and grit, and sparingly soaped to receive the succeeding sections. Prior to snapping the gasket onto the spigot groove of the riser section, the gasket shall be wiped clean and soaped. Care shall be taken to keep soap off of concrete so as to insure proper bonding of the coating materials. A screw driver or similar tools shall be inserted beneath the gasket and run around the pipe to insure even seating. The riser section with gasket in place shall then be lowered into the bell of the previously placed section taking care that no dirt is present in the joint or on the gasket.

All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer.

Dampproofing: Dampproofing materials shall be delivered to the site in the manufacturer's sealed containers, clearly marked with name of the product. Application methods and temperature shall be in accordance with the written recommendations of the manufacturer as approved by the ENGINEER.

Two coats of exterior coating shall be Bitumastic Super Service Black manufactured by Koppers Company, Inc., or approved equal. The coatings shall be applied according to the manufacturer's latest instructions.

All benches, concrete channel inverts and interior walls of the manhole base up to the top of the highest pipe shall be coated with two coats of Sikagard 63 manufactured by Sika Corporation or Duralkoite 312 as manufactured by Dural International Corporation or ENGINEER approved equal. The material shall be applied according to the manufacturer's instructions. Interior surfaces above the top of the highest pipe shall be coated with one of the materials specified for exterior coating in the above paragraph.

Invert Channels and Benches: Invert channels and benches shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with smooth curves of a large radius as the size of the manhole will permit and the pipes shall stop at the inside face of the manhole where such changes in direction occur. Invert channels and benches shall be constructed of formed concrete.

Completed manholes shall be subject to an infiltration or exfiltration test. These tests shall meet the requirements listed under "Testing of Sewers". Manholes which do not meet the test requirements shall be repaired by the CONTRACTOR at his/her expense.

Length of Sections: Unless otherwise indicated, precast manhole sections shall be of such lengths as will permit the setting of the manhole frame to the required elevation on top of the upper section. The top riser section shall be 1220mm maximum in length. The manhole frame shall be brought to finish grade with a minimum of two courses of brick and it shall be firmly set in a bed of mortar not less than 12 millimeters thick.

METHOD OF MEASUREMENT

Manholes: The quantity to be paid for under these items shall be the linear meter of manhole completed in accordance with the plans and specifications. Depth of manholes will be measured from the invert elevation of the downstream pipe to the top of the masonry elevation.

Junction Chamber: Payment for junction chambers will be made on additional lump sum basis and shall include all necessary pipe stubs and connections of stubs to existing sewers.

BASIS OF PAYMENT

General:

The unit price bid or lump sum bid shall include all labor, equipment and materials necessary to complete the work as specified. Frames and covers, excavation and surface restoration will be paid for separately under their appropriate items.

Progress Payments:

Seventy-five (75) percent of the unit price bid for structures installed, complete in place, will be paid upon acceptable installation of the structures before successful completion of

the required field tests.

The full unit price bid for structures installed will be paid upon successful completion of the required field tests and substantial completion of all other work items including restoration.

Payment will be made under:

Item No.	**Item**	**Pay Unit**
604.04M	Manholes and Junction Chambers	M or LS

Pay Unit is “M” for manholes and “LS” for junction chambers.